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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,802	09/04/2003	Erik Scher	40-001320US	7085
22798	7590	07/08/2004	EXAMINER	
QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C. P O BOX 458 ALAMEDA, CA 94501			DIAMOND, ALAN D	
			ART UNIT	PAPER NUMBER

1753

DATE MAILED: 07/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/656,802	Applicant(s) SCHER ET AL.	
	Examiner Alan Diamond	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-165 is/are pending in the application.
- 4a) Of the above claim(s) 94-165 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/23/04, 3/17/04, 4/28/04, 6/18/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-93 in the reply filed on May 11, 2004 is acknowledged.
2. Claims 94-165 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 11, 2004.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: reference signs 854a and 854b at page 44, third line from the bottom. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: On page 23, second line from the bottom, the U.S. Patent Application Serial No. should be filled in for

Art Unit: 1753

the blank space. On page 35, at each of lines 7 and 8, the term “nanostructures 1208” should be changed to “nanostructures 1204”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3, 21, 39, 71, and 75 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, at line 2, the term “substantially tetrahedral” is indefinite because it is subjective.

Claim 21 is indefinite because “the photoactive layers” (plural) at lines 1-2 lack positive antecedent support in claim 20.

Claim 39 is indefinite because “the cores” at line 1 and “the shells” at line 2 lack positive antecedent support in claim 1.

In claim 71, at line 1, the term “substantially free” is indefinite because it is subjective.

In claim 75, at line 2, the term “substantially tetrahedral” is indefinite because it is subjective.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1753

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-93 are rejected under 35 U.S.C. 102(b) as being anticipated by Motohiro et al, U.S. Patent 5,571,612.

Motohiro et al teaches a photovoltaic device comprising a first electrode layer, a second electrode layer, and a photoactive layer disposed between the first and second electrode layers, wherein the photoactive layer comprises CdS and CdTe nanostructures comprising at least on elongated section oriented predominantly normal as here claimed (see col. 5, lines 23-35, Example 3 at col. 8; and Figure 3). Said CdS and CdTe exhibit a type II band offset energy profile (see instant claim 5). Since Motohiro et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

9. Claims 1-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Kalkan et al, U.S. Patent Application Publication 2002/0192441.

Kalkan et al teaches a photovoltaic device comprising a substrate electrode (10), a conductive layer (11) and nanoprotusions (13) made from CdSe (see Example 1 at page 3; and Figure 1). The CdSe exhibits a type II band offset energy profile. Since Kalkan et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Art Unit: 1753

10. Claims 1-93 are rejected under 35 U.S.C. 102(e) as being anticipated by Curtin, U.S. Patent Application Publication 2004/0003838.

Curtin et al teaches a nanophotovoltaic cell comprising a first electrode (34), a second electrode (40), and a photoactive layer comprising plural nanocones, each nanocone comprising p-type CdSe and n-type CdS (see figure 3; and paragraphs 0053 to 0057). The CdSe and CdS exhibit a type II band offset energy profile. Since Curtin teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 102/103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-93 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Den et al, EP 1087446 A2.

Den et al teaches a photovoltaic device comprising first and second electrode layers, and a photoactive layer disposed between the first and second electrode layers, wherein the photoactive layer comprises nanoparticles of TiO₂ or ZnO, or a mixture of TiO₂ and ZnO, and wherein the nanoparticles have at least one elongated section oriented predominantly normal as here claimed (see Figures 8A-C, 9A-B; and paragraphs 0044, 0053, and 0059). It is the Examiner's position that said TiO₂ and ZnO inherently exhibit a type II band offset energy profile. Since Den et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Art Unit: 1753

In addition, the presently claimed requirement that photoactive layer comprises material that exhibits a type II band offset energy profile would obviously have been present once Den et al's TiO₂ and ZnO are provided. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

Claim Rejections - 35 USC § 103

13. Claims 47-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa, U.S. Patent Application Publication 2002/0040728.

Yoshikawa teaches a photovoltaic device comprising a first electrode layer (10a), a second electrode layer (40a), and a photoactive layer (20) disposed between the first and second electrode layers, wherein the photoactive layer can comprise semiconductor nanoparticles of two or more of CdS, CdSe, CdTe, GaP, GaAs, PbS, etc, which have a type II band offset energy profile (see paragraphs 0084 to 0088, and 0168; and Figure 2). Alternatively, the semiconductor nanoparticles can be, for example, ZnO with SnO₂, or ZnO with WO₃. It is the Examiner's position that said ZnO, SnO₂ and WO₃ also have a type II band offset energy profile. Yoshikawa teaches the limitations of the instant claims other than the difference which is discussed below.

Yoshikawa does not provide a specific example wherein mixtures of semiconductor nanoparticles are used. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used mixtures of Yoshikawa's semiconductor nanoparticles in Yoshikawa's photoactive layer because such is clearly within the scope of Yoshikawa's disclosure.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 1-93 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-164 of copending Application No. 10/778,009. Although the conflicting claims are not identical, they are not patentably distinct from each other because the photovoltaic device in the claims of said copending application has the instant photoactive layer that comprises a material that exhibits a type II band offset energy profile.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Application Publications 2003/0145779 and 2004/0095658 are hereby made of record.

Art Unit: 1753


17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
July 2, 2004

Alan Diamond
Primary Examiner
Art Unit 1753

A handwritten signature in black ink, appearing to read 'Alan Diamond', written in a cursive style.